II. **Remarks**

Claims 3, 5-6, 8-9 and 11-17 were pending in this application. The present amendment adds new claims 18-20. No new matter has been added by the present amendment. After this amendment, claims 3, 5-6, 8-9 and 11-20 will be pending.

Reconsideration of the application in view of the above amendments and following remarks is respectfully requested.

Rejections under 35 U.S.C. § 103

Claims 3, 5-6, 8-9, and 11-17 were rejected under 35 U.S.C. § 103(a) as being un-patentable over U. S. Patent No. 6,394,487 issued to Heudorfer et al. ("Heudorfer") in view of U. S. Patent No. 6,343,811 issued to Hammer et al. ("Hammer"). In view of the remarks contained herein, Applicants respectfully submit that the rejections of claims 3, 5-6, 8-9, and 11-17 are traversed.

Applicants' present invention is concerned with providing an air bag arrangement such that at an initial stage of a collision, the expanded air bag maintains a relatively low tension across the entire air bag so as to be rather soft for protecting the head of the occupant. Then at a latter stage of the collision, the expanded air bag maintains a relatively high tension across the entire air bag so as to be developed to its fullest for restraining the occupant from being thrown out of the vehicle in the event of the vehicle turning over (e.g. rolling over). Applicants' application at paragraphs [0005]-[0007]. As

illustrated in the embodiment shown in Figure 4, the primary chambers are substantially expanded and developed at the initial stage of the collision (e.g. after about 20 to 30 msec from the time of detecting a collision or potential collision). At the latter stage of the collision (e.g. after about 1000 msec from the time of detecting a collision or potential collision), the internal pressures of the primary chambers drop to a lower level while the secondary chamber expands to its peak pressure to compensate for the drop in pressure of the primary chambers and further, to increase tension across the air bag to restrain the occupant from being thrown out of the vehicle in the event of the vehicle turning over (e.g. rolling over). The sequential increase in tension across the air bag is provided by substantially varying the difference in size between the aperture of the primary chamber and the opening of the secondary chamber for controlling the inflow of gas into each of the respective chambers. Accordingly, claims 3, 6 and 9 recite that the aperture and the opening are sized such that the aperture is substantially larger than the opening so that the secondary chamber begins to substantially expand and develop after the primary chamber is approximately fully expanded and developed by gas from the gas generator. Neither Heudorfer nor Hammer disclose, teach or suggest such a limitation.

Heudorfer discloses an inflatable air bag for a motor vehicle. The air bag 100 is configured to be connected to a gas generator 12 and includes a main chamber 170. The main chamber 170 is divided into a pair of large chambers 174, 178 and a spherical chamber 176. A gas inlet 132 of the

spherical chamber 176 connects with an upper narrow longitudinal section 175 of the main chamber 170 which delivers gas to inflate both the spherical chamber 176 and one of the large chambers 174. A finger shaped chamber 172 extends longitudinally away from the main chamber 170 and is separated from the spherical chamber 176 by the large chamber 174. *Heudorfer* at col. 5, lines 36-59 and Figure 2. As illustrated, the finger shaped chamber 172 receives gas from the narrow longitudinal section 175 for inflation. *Id.*

The Examiner posits that the spherically shaped chamber 176, the gas inlet 132 and the finger chamber 172 are analogous to Applicants' claimed "primary chamber", "aperture" and "secondary chamber", respectively, and that the inlet for the finger shaped chamber, which receives gas from the narrow longitudinal section 175, is analogous to Applicants' claimed "opening". Office Action at Pages 2-3. Notably, however, the suggested analogous opening of Heudorfer is illustrated as being about the same size as the narrow longitudinal section 175, and the suggested analogous aperture (i.e. gas inlet 132) is illustrated as being only slightly larger than the narrow longitudinal section 175. As is well known to one of ordinary skill in the art of fluid dynamics, the rate of gas delivery is limited by the minimum flow area through which the gas is flowing. Here, the minimum flow area for delivering gas to both the spherical chamber 176 and the finger chamber 172 is defined by the narrow longitudinal section 175. Thus, the rate of gas being delivered to both the finger chamber 172 and the spherical chamber occurs concurrently and at about the same rate. In practice, the finger chamber 172 and the spherical

chamber 176 will begin to expand and develop at about the same time (i.e. at the initial stage of the collision) by gas from the gas generator. Moreover, although the suggested analogous opening of Heudorfer is smaller than the gas inlet 132, the slight size difference does not remotely approach the substantial size difference of the opening and aperture of Applicants' present invention as disclosed in Figures 1-2 and 5-7. Accordingly, it cannot be said that Heudorfer discloses, teaches or suggests an aperture and an opening being sized such that the aperture is substantially larger than the opening so that the secondary chamber begins to substantially expand and develop after the primary chamber is approximately fully expanded and developed by gas from the gas generator.

Hammer discloses a side air bag 10 for a motor vehicle. The side air bag 10 has a gas generator 38 and a plurality of gas chambers 30. Notably, the gas chambers 30 have inlet openings 32, which are substantially the same size, providing fluid communication with the gas generator via a passageway 36 for inflating the chambers 30. The air bag 10 also has two tethers 33 and 31 which are disposed at opposing ends of the air bag 10 along a lower portion of the air bag 10.

Neither Heudorfer nor Hammer independently or in combination, disclose, teach or suggest the present invention recited in independent claims 3, 6 and 9. More specifically, neither Heudorfer nor Hammer disclose, teach or suggest an aperture and an opening being sized such that the aperture is substantially larger than the opening so that the secondary chamber begins to

substantially expand and develop after the primary chamber is approximately fully expanded and developed by gas from the gas generator. In that Heudorfer and Hammer lack the noted elements of claims 3, 6 and 9, the rejections based thereon should be withdrawn.

Moreover, claims 5, 8 and 11 each recite that the opening of the secondary chamber is in fluid communication with the primary chamber, and the secondary chamber is expanded by an inflow of the gas from the primary chamber. Neither Heudorfer nor Hammer disclose, teach or suggest such a limitation. In Heudorfer, the finger shaped chamber 172 is expanded by an inflow of gas from the upper narrow longitudinal section 175 of the main chamber 170 and not from the spherical chamber 176. In Hammer, each of the gas chambers 30 is expanded by an inflow of gas from the passageway 36 and not from one of the other chambers 30.

Accordingly, Applicants believe claims 3, 6 and 9 and their dependent claims 5, 8, and 11-17 are in a condition for allowance.

Claims 18-20 have been added and are supported in paragraphs [0011], [0016] and [0018] and Figures 1-2 and 5-7. Applicants believe that these claims are allowable since they depend on claims 3, 6 and 9, and for their own specific elements recited therein.

Conclusion

In view of the above amendments and remarks, it is respectfully submitted that the present form of the claims are patentably distinguishable over the art of record and that this application is now in condition for allowance. Such action is respectfully requested.

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